REPORT

OF THE

COMMITTEE ON MEDICAL SCIENCES,

PRESENTED AT THE THIRD ANNUAL MEETING

OF THE

AMERICAN MEDICAL ASSOCIATION,

CINCINNATI, MAY, 1850,

BY USHER PARSONS, M. D., CHAIRMAN.

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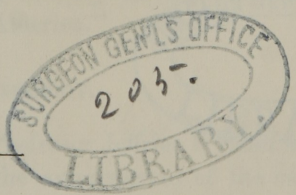

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COMMITTEE ON MEDICAL SCIENCES.

THE duties of the Committee on Medical Sciences have been considerably curtailed, since the Association was first organized, by transferring several subjects originally confided to it, to the charge of special committees. By a resolution adopted at the last annual meeting, the customary range of the standing committees was further restricted to the limits prescribed by the Constitution, which directs them to report only upon the progress of American Medicine during the year of their service. This circumstance will account for the brevity of this report, as compared with those of former committees. Hoping, however, that its deficiencies will be more than supplied by the reports which are to follow, the chairman will proceed to state those facts, illustrating the progress of medical science in the departments assigned to this committee,* which have been gleaned from the medical journals and other publications of the year, and from numerous correspondents. These departments are Anatomy, Physiology, General Pathology and Therapeutics, with "other branches of Natural Science, bearing directly on the conditions and progress of medical knowledge in America."

ANATOMY AND PHYSIOLOGY.

Arrangement of Cancelli in Bone.—Professor Jeffries Wyman has stated these general conclusions as to the arrangement of the cancelli in human bones.

"1. The cancelli of such bones as assist in supporting the weight of the body, are arranged either in the direction of that weight, or in such a manner as to support and brace those cancelli which are

* The committee consisted of Drs. Usher Parsons, Jacob Bigelow, J. B. S. Jackson, A. B. Malcolm, James Moultrie, G. Emerson, and David King.

in that direction. In a mechanical point of view, they may be regarded in nearly all these bones as a series of 'studs' and 'braces.'

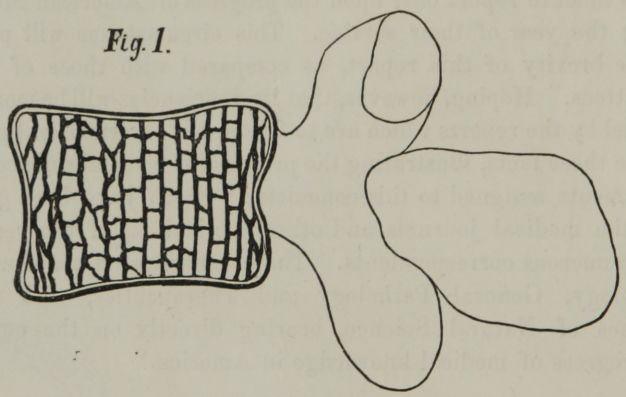
"2. The direction of these fibres in some of the bones of the human skeleton is characteristic, and it is believed has a definite relation to the erect position, which is naturally assumed by man alone."

These structures are most uniform and clearly defined in adult and middle-aged skeletons.

In the lumbar vertebræ, which support the weight of the body vertically, these cancelli run vertically and transversely, the vertical fibres directly sustaining the pressure, the transverse ones bracing them at right angles.

The neck of the thigh-bone is adapted to resist pressure by its oval form, the longest axis being vertical, and by the greater thickness of the wall of bone on its under side, to which the weight is more directly transmitted. Dr. Wyman describes another provision, which consists "in having the cancelli of each femur so arranged as to form a segment of a framed arch or truss, which co-operates with

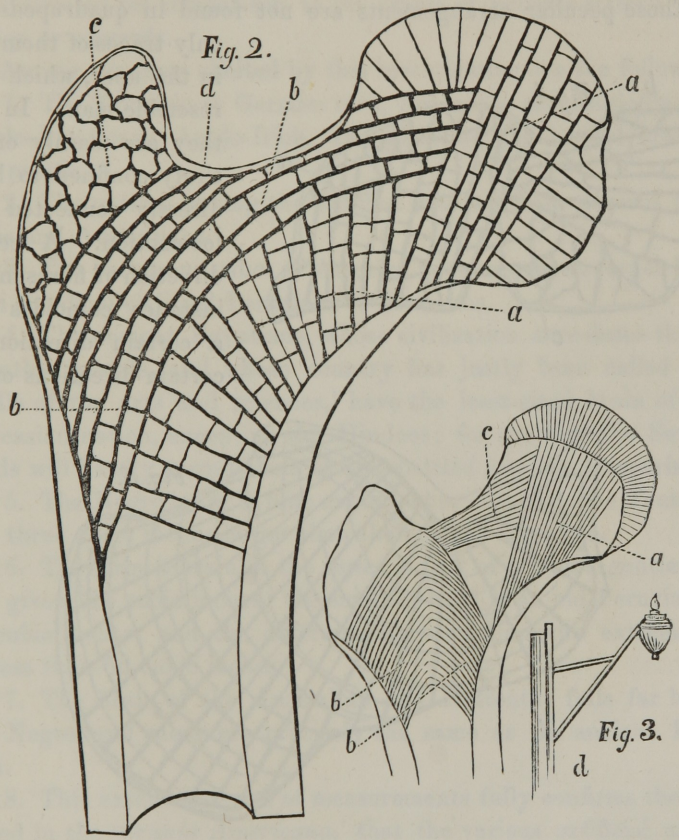
Fig. 1.



Plan of Lumbar Vertebra.

the external shell in sustaining the weight of the body; the necks of the two femora forming together opposite segments of an arch." He describes two sets of cancelli. One set (*a*, *a*) rests or abuts on the convex surface of the thick shell which forms the under wall of the neck, and from this they diverge toward the upper portion of the head, neck, trochanter major, and portion of the shaft just below this last; those which extend into the head are much the longest. The fibres of the second series (*b*, *b*) are arranged in parallel curves, the extremes of which are attached on the one hand to the wall of

bone at the base of the great trochanter, and on the other to that portion of the preceding class of fibres which supports the upper surface of the head, as well as to the shell of bone between it and the trochanter. Both of these series are braced by other fibres, which are arranged at right angles to their direction. The cancelli of the great trochanter (*c*) have no determinate form. The internal



Plan of Neck of Femur.

fibres thus act as braces, assisting the outer walls to support the weight of the body; the curved fibres (*b*, *b*) resisting by their tenacity, the straight or radiating ones (*a*, *a*) by their rigidity. The long straight fibres (*a*) transmit weight directly to the under side of the neck, and are themselves supported by the curved fibres (*b*, *b*), and these in turn by the radiating fibres (*a*).

In the lower part of the femur and the tibia, the cancelli are adapted to support vertical pressure.

On the astragalus, the pressure is vertical; but this bone rests on two others; one below it, the os calcis, the other in front, the scaphoides; within there exist two series of cancelli, directing the pressure on the surfaces of support. Very nearly the same description applies to the os calcis, where there are two intersecting sets of fibres, the one radiating, the other in concentric curves.

These peculiar arrangements are not found in quadrupeds, and only traces of them exist in the apes, which most resemble man. In him, they are mainly or entirely confined to bones directly connected with locomotion. A certain direction of fibres in each instance coincides with a certain direction, or certain directions of the

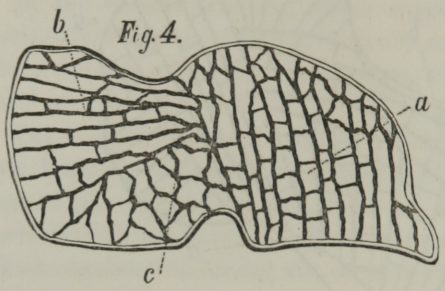


Fig. 4.

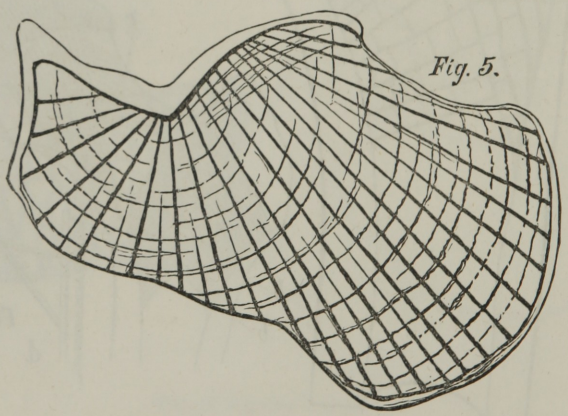


Fig. 5.

Plans of Astragalus and Os Calcis.

transmission of pressure. From this constant association of structure and function, says Professor Wyman, the inference seems unavoidable, that they are means and ends.*

Capacity of Crania in different races of Man.—Dr. Samuel G. Morton, author of "*Crania Americana*," a work which does honour

* Boston Journal of Natural History, vol. vi. No. 1, page 125.

to the country and himself, has recently published the results of the internal measurements of six hundred and twenty-three human crania, "made with a view to ascertain the relative size of the brain in various races and families of man." His process for measurement was to fill each cranium with leaden shot, and determine its absolute capacity, or the bulk of the brain, in cubic inches. He restricted his comparison to the crania of persons sixteen years of age or upwards.

"Among the facts elicited by this investigation are the following:

"1. The Teutonic or German race, embracing the Anglo-Saxons, Anglo-Americans, Anglo-Irish, &c., possesses the largest brain of any people.

"2. The nations having the smallest heads are the ancient Peruvians and Australians.

"3. The barbarous tribes of America possess a much larger brain than the demi-civilized Peruvians or Mexicans.

"4. The ancient Egyptians, whose civilization ante-dates that of all other people, and whose country has justly been called 'the cradle of the arts and sciences,' have the least-sized brain of any Caucasian nation, excepting the Hindoos; for the very few Semitic heads will hardly permit them to be admitted into the comparison.

"5. The Negro brain is nine cubic inches less than the Teutonic, and three cubic inches larger than the ancient Egyptian.

"6. The largest brain in the series is that of a Dutch gentleman, and gives 114 cubic inches; the smallest head is an old Peruvian, of 58 cubic inches; and the difference between these two extremes is no less than 56 cubic inches.

"7. The brain of the Australian and Hottentot falls far below the Negro, and measures precisely the same as the ancient Peruvian.

"8. This extended series of measurements fully confirms the fact stated in the '*Crania Americana*,' that the various artificial modes of distorting the cranium occasion no diminution of its internal capacity, and consequently do not affect the size of the brain."

TABLE,

Showing the Size of the Brain in cubic inches, as obtained from the internal measurement of 623 *Crania of various Races and Families of Man.*

RACES AND FAMILIES.	No. of Skulls.	Largest I. C.	Smallest. I. C.	Mean.	Mean.
MODERN CAUCASIAN GROUP.					
Teutonic Family.					
Germans,	18	114	70	90	92
English,	5	105	91	96	
Anglo-Americans,	7	97	82	90	
Pelasgic Family.					
Persians,	10	94	75	84	
Armenians,					
Circassians,					
Celtic Family.					
Native Irish,	6	97	78	87	
Indostanic Family.					
Bengalees, &c.,	32	91	67	80	
Semitic Family.					
Arabs,	3	98	84	89	
Nilotic Family.					
Fellahs,	17	96	66	80	
ANCIENT CAUCASIAN GROUP.					
From the Catacombs. Pelasgic Family.					
Græco-Egyptians,	18	97	74	88	
Nilotic Family.					
Egyptians,	55	96	68	80	
MONGOLIAN GROUP.					
Chinese Family,	6	91	70	82	
MALAY GROUP.					
Malayan Family,	20	97	68	86	85
Polynesian Family,	3	84	82	83	
AMERICAN GROUP.					
Toltecan Family.					
Peruvians,	155	101	58	75	
Mexicans,	22	92	67	79	
Barbarous Tribes.					79
Iroquois,					
Lenapé,	161	104	70	84	
Cherokee,					
Shoshoné, &c.,					
NEGRO GROUP.					
Native African Family,	62	99	65	83	83
American-born Negroes,	12	89	73	82	
Hottentot Family,	3	83	68	75	
Alforian Family.					
Australians,	8	83	63	75	

Embryonic Conditions persistent in the Cranium.—Dr. John Neill mentions two peculiarities which are more or less completely characteristic of the African skull. One is the division of the articulating surface of the occipital condyle into two faces by a transverse ridge or groove. The two faces are sufficiently rounded off in some cases to give the outline of the figure 8, instead of an oval. On an examination of Dr. Morton's collection, which adorns the Hall of the American Academy of Natural Sciences, it was found that this mark existed in thirty out of eighty-one African crania, in only four pure Egyptian heads, and three out of one hundred and five heads of Aboriginal Americans, but in none of the one hundred and twenty-nine skulls of other nations, whose history was well known. The occasional existence of this mark has been previously noticed, but Dr. Neill has first pointed out its rarity in other than African crania. He suggests that this transverse mark represents the fissure which in the fœtus separates the basi-occipital bone from the next piece of the occiput on each side. This fact, if it holds generally, may be considered an illustration of the law thus propounded by Agassiz: "In the different formations through which animals pass, from the first formation in the embryo up to the full-grown condition, may be found a natural scale, by which to measure and estimate the position to ascribe to any animals." Thus, the persistence of a fœtal stage of formation would mark the race to which it was peculiar as a lower variety of the species.

Fig. 7.

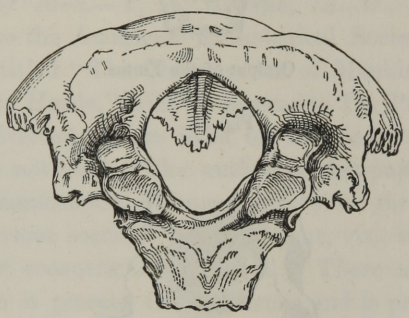
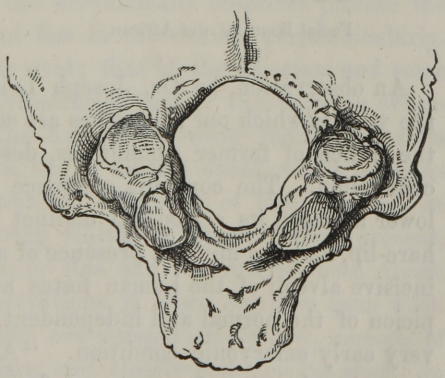


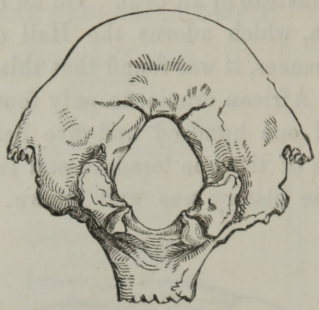
Fig. 8.



Another fœtal peculiarity persistent in the African head, is the absence of a sharp edge at the lower boundary of the

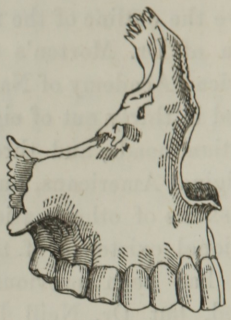
anterior nares, running from the anterior edge of the nasal process to the anterior nasal spine. Other bones of the skull, according to Dr. Neill, exhibit similar facts.*

Fig. 9.



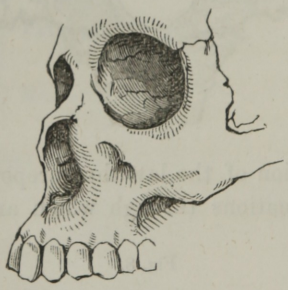
Occiput of the Fœtus.

Fig. 10.



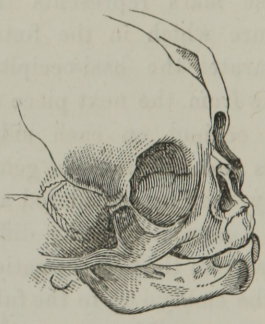
Superior Maxilla of the Caucasian.

Fig. 11.



Facial Bones of the African.

Fig. 12.



Facial Bones of the Fœtus.

An observation, by Dr. Joseph Leidy, not strictly falling within the year to which our researches are confined, but which has escaped the notice of former committees, deserves to be recorded in this connection. The constant existence of an intermaxillary bone in lower animals, its occasional distinct existence in man, in cases of hare-lip, and the uniform presence of a transverse fissure behind the incisive alveoli of the human fœtus at birth, have suggested a suspicion of the normal and independent existence of this bone in the very early embryonic condition. "As the *negro* in his anatomical characters is not so far removed from the embryological condition

* American Journal of Medical Sciences, Jan. 1850.

as the *white*," attention was called to the examination of embryos of the negro race. Dr. Leidy lately met with a specimen where the intermaxillary bone was quite distinct, in an embryo one inch and eleven lines long from heel to vertex, and presumed to be about nine or ten weeks old. The line between this bone and the superior maxillary passes through the alveolar ridge between the incisive and the canine alveoli, and extends transversely inward behind the incisive alveoli, and vertically upward, nearly bisecting the nasal process. Specimens exhibiting the same separation, but a later stage of development, are in the Wistar Museum.*

It is not stated whether any of these specimens were from the negro race.

Hair of Different Races of Men.—P. A. Browne, LL. D., of Philadelphia, communicated to the American Ethnological Society an essay, since published, entitled "The Classification of Mankind by the Hair and Wool of their Heads," with an answer to Dr. Prichard's assertion that the covering of the head of the negro is hair, properly so termed, and not wool. The author of this paper states that, on microscopic examination, there appear to be three prevailing forms of the transverse section of the filament, viz., the cylindrical, the oval, and the eccentrically elliptical. There are also three directions in which it pierces the epidermis and is prolonged to its apex. The straight and lank, the flowing or curled, and the crisped or frizzled, which is sometimes also spirally twisted, differ respectively as to the angle which the filament forms with the skin on leaving it. While the cylindrical and oval pile has an oblique angle of inclination, the eccentrically elliptical pierces the epidermis at right angles, and lies in the dermis perpendicularly. The hair of the white man is oval; that of the Choctaw and some other American Indians is cylindrical; that of the negro is eccentrically elliptical or flat. The hair of the white man, besides its cortex and intermediate fibres, has a central canal, which contains the colouring matter when present. The wool of the negro has no central canal, and the colouring matter is diffused when present, either throughout the cortex, or this and the intermediate fibres. Hair, according to these observations, is more complex than wool. In hair, the enveloping scales are comparatively few, smooth of surface, rounded at their points, and closely embrace the shaft; in

* American Journal of Med. Sciences, April, 1849, page 537. A description and engravings of the two bones are there given.

wool, they are numerous, rough, sharp-pointed, and project from the shaft. Hence the hair of the white man will not felt; the wool of the negro will.

The chairman of this committee has recently had the opportunity of examining a young Bushman, brought to this country by Mr. Isaac Chase, formerly United States consul at the Cape of Good Hope. He was the only specimen of this tribe known to have reached this country, and died during the last summer of cholera. His hair lay in little distinct, compact curly tufts, twisted spirally; and in the intervals of these tufts, the skin was distinctly seen. The filaments were very fine, some of them five inches long, and black. They contained a distinct cortex, and granular medulla. The transverse section of a filament resembled that of the negro's, except in being concave on one of the two longer sides of the ellipse; that is, it was flat, and concavo-convex.

Vascular Injection for Microscopic Researches.—Dr. P. B. Goddard describes a new material and process for making very minute anatomical injections, adapted for examination by the microscope. The materials are vermilion very finely ground in oil, and sulphuric ether; one part of the vermilion paint being put to twenty or thirty parts of the ether, to be well shaken before use. This is to be injected with a slow, gradual, and moderate pressure, by an artery, leaving the corresponding vein open. The coloured matter at first issues from the vein, but soon only clear ether appears. The ether may be driven off by heat, leaving a very minute injection of the capillaries.*

Direct Exploration of the Interior of the Eye.—Dr. T. Wood, of Cincinnati, has described phenomena which suggest a new mode of direct exploration. He states that, by means of a small double convex lens, of short focus, held near the eye, that organ looking through it at a candle twelve or fifteen feet distant, there will be perceived a large luminous disc, covered with dark and light spots and dark streaks, which, after a momentary confusion, will settle down into an unchanging picture; which picture is composed of the organs or internal parts of the eye. The eye is thus enabled to view its own internal organization, to have a beautiful exhibition of the vessels of the cornea, of the distribution of the lachrymal

* Philadelphia Medical Examiner.

secretions in the act of winking, and to see into the nature and cause of muscæ volitantes.

To impart to others an idea of this representation, as well as the mode of analyzing the phenomena, a few figures accompany the communication. The explanation given is, that the light and dark moving spots in the plane of the cornea represent the tears and fluids that lubricate the external conjunctival surface of the organ; the vascular net-work, seen posterior to this, is an arrangement of blood-vessels in the structure of the cornea, which Dr. Wood believes himself to have been the first to observe; the fringed circle that bounds the illuminated disc is the inner edge of the iris; and what have been called muscæ volitantes, are only the globular vesicles of the vitreous humour, posterior still to the preceding, assuming a chain-like arrangement toward the central vertical line, and are essential parts of the organ, instead of being abnormal. The reasons for this opinion accompany the details of the exposition, which are also shown to be compatible with the laws of optics.*

Experiments on the Motor Powers.—Dr. Bennet Dowler, of New Orleans, has been favourably known as a medical observer. Within the year, he has furnished some new "Contributions to Physiology." He gives an account of vivisections performed on the great Saurian of Louisiana. Seven alligators appear to have been sacrificed in these experiments. One alligator, after the spinal marrow had been cut across, between the shoulders and hips, "during a period of two hours, displayed complete intelligence, volition, and voluntary motion *in all divisions of the body.*" The signs from which Dr. Dowler makes this inference were, associated and adaptive movements of the lateral muscles of the body, and of the hind legs, in response to irritations applied to the viscera, or above the part of the spinal marrow which was divided. Others showed similar powers after decapitation, or after the brain and medulla oblongata had been removed. In one case, these movements were produced by "pinching, puncturing, and burning," for three or four hours after the head was cut off. Tying the trachea stopped them sooner and more completely. The separated heads, until the brain was destroyed, continued to show their vitality by biting, winking, looks of anger and fear, and, in one pathetic instance, by affectionately recognizing the voice, and eyeing the movements, of a fond negro!

* Western Lancet and Hospital Reporter, Nov. 1849.

One alligator was beheaded with a dull hatchet, producing little hemorrhage. Dr. Dowler thus relates the sequel: "I carried the handle of the knife towards the eye, to ascertain whether it would wink, whereupon the ferocious separated head sprang up from the table with great force at me, passing very near my breast, which received several drops of blood; it alighted upon the floor, from six to eight feet distant from its original position!" Dr. Dowler, who is familiar with the anatomy of the alligator, can find no muscle to account for this feat.

Dr. Dowler seems to believe that these observations are destined to overthrow received doctrines in neurology; those of Marshall Hall in particular. But these doctrines recognize the indisputable facts that associated and adaptive movements take place independently of the brain, not through the medium of feeling and volition; and that irritation of one point of the spinal marrow, or one spinal nerve, will cause motions in distant parts of the motor apparatus. Dr D. regards all such movements as signs of intelligence, feeling, and will, a view we suppose to be disproved by numerous facts.

His experiments would appear to show that, after the spinal marrow was thoroughly divided, the *lower* limbs moved on irritants being applied to the *upper* parts of the trunk. This, if confirmed by larger experience, is not in accordance with doctrines founded on the numerous and trustworthy observations of European physiologists. The heart was seen to beat after being freed from blood, separated from the nerves, roughly handled, and considerably desiccated; well illustrating its inherent contractile power.

Dr. Dowler is a bold experimenter, and his laudable zeal and industry have already added many valuable facts to medical science, and we doubt not his future labours will either strengthen or correct the opinions he has advanced.

Development of Organic Cells.—Since the discoveries of Schwann and Schleiden on the formation of cells, the essential organic element of animal and vegetable bodies, little has been added to their doctrines. Their account of the appearance of nuclei in an organizable liquid, and of the growth of cells upon and around these nuclei, has been applied to all living forms. Dr. W. J. Burnett laid before the American Association for the Advancement of Science, at its late meeting in Cambridge, some observations on the origin of animal cells, quite different from the views generally received. His observations were made on the epithelial cells of

mucous membranes, and on pus-cells, the result of inflammation. He thus describes their results: "In the first place, there appears in the cyto-blastema, a dark point or nucleus.

"2. This nucleus is next seen to be a hollow sphere, containing nothing but a clear liquid.

"3. This clear liquid is cloudy, and filled with minute immeasurable granules.

"4. The cloudiness is less marked, and in some cases nearly absent, but a dark body is seen in its centre.

"5. By this time the cell-membrane, or the wall of the primal nucleus hollowed out, has much enlarged, so that we have then a distinct nucleated cell.

"6. This nucleus then begins to be hollowed into a sphere, as did its predecessor, and then passes like that from a clear to a cloudy vesicle, until the formation of its own nucleus. By this time, the outer cell-membrane bursts, having completed its term of existence; this having taken place, the nucleus is discharged, and we have then a *nucleated* cell as before. Sometimes, however, the outer cell-membrane does not burst, and we have then a *nucleolated* cell; but this is not the most common manner of proceeding."

Besides this endogenous method of reproduction, the cells, particularly those belonging to epithelial structures, are sometimes multiplied fissiparously, as occurs most commonly with vegetable cells.

These observations are quite analogous to those of Agassiz on the development of the ova of radiata and mollusca. It would seem that the great law of development is the same in both cases. If so, this is a new acquisition in science; the morphological identity of the cell and the ovum having never before been traced from actual observation, so far as known by Dr. Burnett.

Professor Agassiz, after the reading of this paper, made some remarks, suggesting that the difference between animal and vegetable cells had not been sufficiently attended to, and that a broad field of inquiry is opened in the comparison of different forms of cells. He pointed out the analogies and differences between the egg-cell and cells developed in full-grown animal tissue.*

Allotropism in the Living Organic Elements.—Professor J. W. Draper, of New York, offers some observation on "the existence

* Proceedings of American Association for Advancement of Science, Second Meeting page 261.

and effects of *allotropism* in the constituent elements of living beings." It is not necessary to explain the meaning of this term, which is applied to inorganic and elementary bodies that appear in different forms, assuming different physical and chemical relations. The three leading neutral nitrogenized bodies, fibrin, albumen and casein, are in a remarkable manner allotropic. First, they are mutually convertible, hardly deserving to be called distinct substances more than charcoal, plumbago, and diamond, allotropic forms of carbon. Again, each one of them easily assumes new forms; one variety of fibrin being soluble in water, another being not so, &c.

Of the agents which, in the inorganic kingdom, bring about these changes, the imponderable principles are the most important. Dr. Draper believes that the nervous system has a similar power of changing the allotropic condition of these proximate elements of the body, and that the existing allotropic state of an organized molecule determines whether it shall yield to the oxidizing influence of arterial blood, or not, "that this is the fundamental fact on which all the laws of interstitial death depend." He suggests that inflammation may begin by an allotropic change in the soft solids of the part, disposing them to more active oxidation. Hence, according to the laws of circulation he has formerly so beautifully developed, an increased afflux of blood would result. Hence, too, a higher proportion in the urine of urea and sulphuric acid, results of the oxidation of the proximate elements above named. In congestion, these conditions are all reversed. This view seems to harmonize with the facts, and presents them more clearly to our minds.*

Quantity of Blood in the Body.—Professor James Blake, of the St. Louis University, has communicated the results of some experiments, made to determine the quantity of blood in the body. A weighed quantity of sulphate of alumina was injected into the veins, and a weighed portion of the blood analyzed. The salt having time to mix well with the blood of the animal before death, the analysis furnished the means of determining the whole amount of blood with which the salt had been mixed. The combination of the salt with the tissues might, however, prove a source of error, or a fallacy might arise from its having been excreted. But this would affect the result only in one direction, namely, by furnishing a greater

* London, Edinburgh, and Dublin Philos. Mag., April, 1849, page 241.

quantity of blood than really exists. But these experiments, in fact, would show the weight of the blood of a dog to be one-eighth or one-ninth the weight of the animal, which is much less than the generally believed average amount. And that this is a nearer approximation to the truth than has yet been attained, is evident from the fact that it corresponds best with the velocity of the circulation and relative capacity of the heart, it being difficult to conceive how, upon the common belief, the blood can circulate with so much rapidity.*

Lymph-Corpuscles Visible in Dried Blood.—When blood exists on articles of furniture, clothing, &c., in large quantities, general inspection with the aid of chemistry will determine its presence with sufficient accuracy; but it is not unfrequently found on wearing apparel, walls, instruments, &c., in quantities too small for analysis. Often the mere statement of a non-professional spectator or policeman has been admitted as evidence, when the opinion of a physician even should have been received with great caution.

Cases are mentioned in treatises on Medical Jurisprudence, (see *Taylor's Med. Juris.*, Lond. edition, p. 334,) in which persons have been arrested and tried solely in consequence of spots having been found on their apparel or property which were supposed to be blood. Spots of tobacco-spittle have been unhesitatingly pronounced to be blood by non-professional persons and policemen, the true nature of which was subsequently shown by the microscope. It is a matter of no little interest to determine some positive sign or character by which blood, especially dried blood, may be recognized, or by which other substances may be shown to differ from blood.

In an attempt recently made to determine the nature of certain marks supposed to be those of blood, it was found that the microscope gave a reliable means, in some instances, of making this distinction. But little or no reliance can be placed on it in determining whether the blood be that of man or of some of the higher animals. The test mentioned below is not known to be given in works on Medical Jurisprudence.

It had been expected, in these recent observations (in the Massachusetts Medical College), that the blood-discs would become visible when dried blood was softened with salt and water or syrup. But they seldom appeared with any degree of distinctness, especially

* Philadelphia Med. Examiner, Aug., 1849, page 450

when the blood was dried in drops; but if it were spread on glass in an exceedingly delicate film, they were distinctly visible even when dry. A scale or small fragment of dried blood placed under the microscope, and moistened with syrup, soon began to soften down and diffuse itself, or at least expand itself in the liquid. In a few minutes, transparent spots appeared; and these were found, when carefully examined, to consist of vesicles or cells, in which were easily detected, with a magnifying power of five or six hundred diameters, four or five small granules or nuclei. These are the transparent, or "colourless corpuscles." In the drying and subsequent softening of the blood, the blood-discs cease to be easily recognized, while the lymph corpuscles readily assume their original form, even when dried and moistened more than once. These experiments have been repeated a great many times, and the lymph-corpuscles were invariably recognized; they seem therefore to be worthy of mention in connection with legal medicine.

Tobacco-spittle, when placed under the microscope, even if it has been dried and subsequently softened, is found to contain, in great numbers, the epithelium cells from the mouth, also the cuticle scales and hairs of tobacco-leaf, which are at once sufficiently indicative of the sources from which the fluid was derived.*

Relations of the Nitrogen of the Air to Respiration and Voice.— Professor James Moultrie, a member of this committee, has published a paper on the uses of the nitrogen of the air in respiration. It is known that the quantity of nitrogen in expired air is not materially changed, or at least the change is not constant enough to warrant a belief that nitrogen takes any active and essential part in the chemistry of respiration. Physiologists have had to content themselves with the rather meagre view that it serves simply to dilute the oxygen. Dr. Moultrie suggests that the nitrogen is important to the physical relations of the respiratory function, regulating the tension of the air in the pulmonary vesicles, or its volume, or both. It would serve chiefly to regulate the tension of the pulmonary air during expiration. As a medium of sound, responding in part to the vibrations of the vocal chords, or exciting their vibrations, or preserving the volume and tension of the pulmonic air in that state which is essential to the ready and constant use of these organs as instruments of voice, would not the withdrawing of one-half of that

* Communicated by Professor Jeffries Wyman, who conducted the investigation.

element materially change their value in the part assigned them in animal life to fulfil? By ingenious symbols, Dr. Moultrie traces the nitrogen particles from the atmosphere till they part from their oxygen in the pulmonary vesicles, and shows that then, mingled with the carbonic acid and vapour which are to be exhaled, they must contribute to preserve the volume and tension of the cells and extreme tubes of the lungs.*

On Parasitic Life.—Dr. J. Leidy has established the fact that cryptogamic vegetables exist, as a normal condition, in the interior of several species of healthy animals. He describes three new genera of entophytes—Enterobrus, Cladophytum, and Arthromitus —being all confervoid or mycodermatoid. All are found growing from the mucous membrane of the small intestine and commencement of the large intestine of Julus marginatus (*Say*), and from entozoa inhabiting these cavities in the same animal. They were uniformly found in one hundred and sixteen examinations of animals of this species, made immediately after death. In one instance, an ascaris, three lines long, "had no less than twenty-three individuals of Enterobrus, averaging a line in length, besides a quantity of the other two genera, growing upon it, and yet it moved about in so lively a manner that it did not appear the least incommoded by its load of vegetation."

The important point in these observations is, that they show cryptogamic vegetables may exist in the internal organs, and upon entozoa inhabiting these organs, without disturbing the health, and even as an ordinary and normal condition. This does not rebut the idea that other cryptogamia may produce diseases. They are known to exist in aphthæ, in many diseases of the skin, have been found in the secretions of cholera and several acute diseases,† and were lately observed by Dr. Leidy in a case of softening of the stomach. Whether in these instances they are cause or effects of the morbid state, or even a mere coincidence, is not decided.

Dr. Leidy regards the microscopic forms known as Vibrio, as vegetable. In this opinion, he is supported by other observers. After mentioning the discovery of several species, and a new genus of entozoa, he notices the existence of Gregarina in the ventriculus of Julus marginatus. Gregarina has recently attracted much attention, as being supposed to be an animal consisting only of two cells,

* Charleston Medical Journal and Review, May, 1849, page 265.

† See London Journ. of Medicine, Nov. 1849.

and said by Diebold to be destitute of an alimentary canal. Dr. Leidy describes a papilla surmounting the superior cell, with traces of an external communication with the cavities of the cells. He regards it as the larva of the entozoon.*

Dr. H. I. Bowditch has communicated observations on the animal and vegetable parasites which infest the human teeth. They were found in almost every instance among more than forty persons examined, from all classes of society. Of the animal forms, there were three or four species; of the vegetable, one or two. The only persons whose mouths were quite free from them cleansed their teeth four times a-day, using soap once. The number of parasites was proportioned to the neglect of cleanliness. Tobacco juice and smoke did not impair their vitality. The same was true of the chlorine tooth-wash, of powdered bark, soda, ammonia, and various other popular detergents. Soap appeared to destroy them instantly. Pure white soap is recommended as the best substance for cleansing the teeth.†

PATHOLOGY.

On Endemic, Epidemic, and Contagious Diseases.—Some of the finest minds in the profession have lately given to the world their views on the subject of the propagation of epidemic and communicable diseases. The work of Professor John K. Mitchell, on the Cryptogamic Origin of Malarial and Epidemic Diseases, was noticed in last year's report.

Professor J. Knight, of Yale College, has published an Introductory Lecture "On the Propagation of Communicable Diseases." He first considers those affections which are *well known* to be communicable, whether purely local, or attended or followed by constitutional symptoms. From many facts in regard to them, he shows that a disease is not proved to be communicable because many in the same family or neighbourhood are attacked in succession, nor because it travels from place to place. Neither is a disease proved to be not communicable because it sometimes assumes an epidemic character and course—nor because it often or even usually arises from the common external causes of disease—nor because in other respects it does not resemble certain diseases acknowledged to be communicable, as, for instance, the exanthemata—nor because all

* Proceedings of Academy of Natural Sciences, Oct. 1849.

† Proceedings of American Academy of Arts and Sciences, Dec. 1849

who are exposed in an equal degree, or many who are exposed in every degree, do not receive it—nor because, at certain times and places, none of those exposed will receive it. A predisposition or susceptibility must exist, as well as an exciting cause.

Now, cholera, when once prevalent in a place, can hardly be traced to communication, or proved to spread in this way. But the facts in regard to its recent beginning at New York, New Orleans and New Haven are related, and shown to be very similar to those which might attend the commencement of an epidemic of small-pox. They certainly seem at first sight to prove that it spread by communication; and, according to the principles laid down above, the apparently opposing facts do not disprove this idea. Similar facts might be stated in regard to dysentery, erysipelas, and yellow fever.

Dr. Knight's conclusions in regard to this class of diseases are thus stated:—

"1st. All febrile diseases, of a typhoid and malignant type, depend upon, as their predisposing cause, a certain endemic or epidemic constitution of the atmosphere. What this state is is entirely unknown.

"2d. This epidemic constitution, aided by the common exciting causes of disease, is at times sufficient to produce them.

"3d. Whenever this epidemic constitution is present, they will be communicated from the sick to the well, and this communicability is a common cause of their propagation."

Professor S. H. Dickson, of New York, looking at the same subject from another point of view, and passing through a different train of thought, suggests somewhat similar conclusions as to the contagiousness of the same class of diseases.

He mentions two essential characters of contagion. The matter which produces contagious disease must be germinal, or self-multiplying, and this reproduction must depend upon, or be favoured by the very processes of disease which itself gives rise to. The reproductive character, and therefore the organic nature of this matter, which produces contagious disease, is proved by its propagating itself by mere inoculation, with no outward favouring circumstances. When contagious diseases spring up without contagion, from ordinary exciting causes, these causes probably act by exciting the tissues of the body into such morbid processes as engender the germ of disease. We cannot suppose that the outward causes directly produce this germ, since life can only spring from pre-existing life.

The essential matter of contagion is never isolated and examined

by itself, and is too minute to be studied with the microscope. It exists in the cells of cancer—in the newly-produced fluids of the exanthemata—in the pus-globules, and the ichor of certain specific diseases—in connection with animalcules or fungous vegetation—and, lastly, diffused through the blood or certain normal secretions. But it is distinct from all these visible forms which accompany it; it is contained in the fluids, but not identical with them; it is associated with these organic forms, but is not identical with them. In psora, the fact of its communication by fomites, on which the exuding fluid has long been dry, is presumptive proof that the living acarus scabiei is not the essential contagious substance. Dr. Dickson suggests that this might be tested by using the fluid of the itch vesicle, carefully distinguished from the acarus, for inoculation.

As the matter of all contagions is inseparable, and too minute for analysis, we cannot be surprised that it radiates, and is sometimes propagated without contact. The germ of variola may perhaps grow and multiply in another nidus than the human body, which is its proper habitation; as, for example, in the air filled with animal matter; just as rice will grow on damp cotton, or as air-plants grow. This may account for the epidemic prevalence of this disease, and for its springing up at such seasons without any known contagious source. That a sporadic pestilence should occasionally be epidemic is as natural as that one season should be prolific in fruits and insects, which in another season are scarce. All the febrile contagious diseases may be propagated by radiation, except vaccinia, which is not properly a human disease. All non-febrile contagious diseases require contact, it is believed.

The contagiousness of certain diseases is matter of dispute. Typhus, pertussis, puerperal fever, dysentery, yellow fever, cholera, present no palpable matter of contagion, are not conveyed by inoculation, and only very irregularly by infection; but they become epidemic, are self-propagating, easily spreading from a focus, and must be ranked as contagious. Their contagious germ is proved to be organic, and to have its nidus in the human body. In the case of cholera, this is shown by its spread, independent of temperature, soil, and other telluric influences, by its following large masses of human beings, its close adherence to well-adapted centres, and its prompt multiplication under favouring circumstances.*

Professor Dickson speaks of the relations of parasitic life to con-

* American Journ. of Med. Sciences, July, 1849, page 107.

tagion. Parasitic forms always co-existing with certain communicable diseases, and never existing without them, may be considered as virtually the germ of disease. But he mentions many instances where parasites do not interfere with the health of the animals they inhabit, or where they even exist as a normal condition. The important observations of Drs. Leidy and Bowditch, already detailed, illustrate and confirm this view.

Irregular Malarial Diseases.—Professor Kirtland mentions the important influence of malaria in producing not merely fevers, but obscure and anomalous affections, especially of the nervous system. Their prognosis depends in great measure on a correct diagnosis; as, if the cause be allowed to go on unchecked, the results may grow more serious; tubercular disease being often produced. Cinchona and its preparations are not always sufficient remedies. Believing that the nervous centres are primarily attacked, Dr. K. recommends the attempt to excite in these centres an artificial action more compatible with health than the disease is, and to thus overcome the original morbid action. He says that strychnia is extensively used with this view in northern Ohio, and with good success.* In New England, the same remedy is employed in neuralgic cases, under the name of homœopathy.

Re-vaccination.—The late lamented Dr. Fisher, of Boston, who has long given attention to the subject of variola and kindred diseases, and published the best description of them extant, has recently advanced the following propositions, supported by numerous statistical facts:—

"1. That one single and perfect vaccination does not, for all time, in all cases, deprive the system of its susceptibility of variolous disease.

"2. That one or more re-vaccinations *do;* and that, consequently, a physician should recommend re-vaccination, when questioned as to its necessity."

Dr. F. had made other observations, from which were drawn these conclusions:—

"1. A portion of vaccinated persons are protected from smallpox through life by one vaccination.

"2. An indefinite number are protected only for a certain period of time.

* Proceedings of Ohio Medical Convention.

"3. The length of time they are thus protected is undetermined.

"4. Some individuals require to be vaccinated a number of times during life.

"5. The system is protected from variolous contagion, when it is no longer susceptible of vaccine influence, as tested by re-vaccination.

"6. The cow-pox virus does not seem to be more efficacious than the human vaccine virus in its prophylactic virtues, and the influence of the vaccine virus does not seem to be diminished by the number of its removes from the cow, or passages through the human system.

"7. The appearances of vaccine cicatrices furnish no indication that the system may or may not be again influenced by repeated vaccinations.

"8. A plurality of vesicles have no more effect in rendering the system less obnoxious to the influence of re-vaccination than a single vesicle has.

"9. The lapse of time from the period of primary vaccination to that of re-vaccination has some, though but little, effect in preparing the system to be further influenced by the vaccine virus.

"10. The age of puberty tends in a degree to destroy the effect of primary vaccination.

"11. The virus contained in vesicles resulting from re-vaccination has the same anti-vaccine and anti-variolous power as that which is the product of vesicles produced by the primary vaccination."*

Cholera.—The duty of tracing "the progress of epidemics" is assigned to another committee, and the eminent attainments of the chairman of that committee warrant us in expecting that the history of the epidemic cholera of the past year will be presented in the most able and instructive manner. It will be our own duty simply to notice facts connected with the pathology of this disease.

In the admirable "Report on the Cholera in Boston in 1849," published by the city, we have the details of thirty-three autopsies; twelve of males, twenty-one of females. The large majority were adults; the oldest sixty years of age. "The most remarkable and constant appearances were the following:—

"1. An unusual dryness of the pleura, particularly where the anterior edges of the lungs overlap the pericardium; so that, on raising them, the two pleural surfaces separated from each other with some difficulty, and presented a dry and wrinkled appearance, instead of their usual moist and polished aspect.

* Boston Medical and Surgical Journal, Jan. 1850, p. 502.

"2. A nearly empty condition of the pericardium; that cavity often containing not more than eight or ten drops of fluid.

"3. The peritoneum was smeared with a thin layer of slimy, opaline secretion, which was drawn out into minute threads on separating the convolutions of the small intestine. When this substance was not in sufficient quantity to be visible on the peritoneal surface, it could be collected by drawing a few coils of intestine through the fingers, when its slimy, sticky feel was easily recognizable.

"4. A moderate swelling and opacity of Peyer's patches, and of the solitary glands in the lower part of the small intestine; in the large intestine, a similar development of the mucous follicles, the mouths of which were often widely open, and sometimes marked by a black point.

"5. A shrivelled condition of the spleen with deficiency of blood.

"6. A completely contracted and empty state of the urinary bladder, the mucous surface of which was smeared with a thickish, creamy secretion, sometimes abundant, sometimes moderate in amount.

"7. The mucous surface of the vagina was smeared with a somewhat similar secretion, but thicker and less opaque than that in the bladder; rather like thick starch in consistency and aspect."

In the blood, the coagulum was generally remarkably deficient in quantity, or consistency, or both; but not by any means universally so. The consistency of the fluid part varied considerably; in fifteen cases, it was more or less thick and tarry, either throughout the system or in particular situations, often varying in different vessels in the same subject. In fourteen cases, ecchymoses were observed, mostly beneath the endocardium or pericardium, occasionally in the parenchyma of the lungs, on the surface of the kidney, or between the lobules of the pancreas.

The brain was almost universally natural. Moderate serous effusion in the meningeal cavities and the ventricles was often found. In fifteen cases, a quantity of dark, thick, bloody fluid was found in the arachnoid cavity, over the posterior part of the convexities of the hemispheres, just sufficient to besmear the arachnoid surfaces, the arachnoid itself remaining at the same time quite natural. This blood probably transuded after death.

The heart and lungs seldom showed marks of any great congestion; the right cavities of the heart were seldom distended.

The contents of the alimentary canal were various—"thick, thin,

gruelly, gray, yellow, yellowish-white, pink, reddish, or puriform"—sometimes like soap and water, or thickish and dull red, or like rice-water. Albumen and the colouring matter of bile were often present. The flocculi of the "rice-water" fluids, examined by the microscope, were seen to contain columnar epithelium, in masses or detached cells, which constituted nineteen-twentieths of their mass.

The internal surface of the stomach and intestines was almost always pale or natural in colour. There was never general redness. The villi were almost always unusually distinct, appearing tumefied, and whitish opaque. Bile was almost always present in the gall-bladder.

The kidneys were not remarkably altered, often flaccid, without their usual odour, and in three cases presenting, when cut, a peculiar smell, somewhat like that of molasses.

There was no constant relation between the state of the heart, fluidity of the blood, and duration of the disease. Toward the close of the epidemic, the coagula were less abundant and firm, and ecchymoses on the heart were more rare than in the earlier periods.

Rigor mortis, and post-mortem contractions, existed in every fatal case.

The College of Physicians of Philadelphia appointed a committee to examine the condition of the intestines in cholera. This committee felt that ordinary examinations, by the eye alone, had yielded no satisfactory information. They determined "that the intestines, before being submitted to examination, should be finely injected, and subsequently inspected with the microscope." This was done by Dr. John Neill. He employed turpentine coloured with vermilion. The committee observed the development of the Peyerian and solitary glands, and dryness of the peritoneum and other serous membranes, which have already been noticed. Among their additional results are the following. The epithelial layer of the intestinal mucous membrane was, in all the specimens, either entirely removed, or was detached, adhering loosely as a pulpy layer, mixed with mucus, or an albuminoid substance. The villi were denuded of the epithelial covering, but unchanged in other respects. The capillary vessels were entire and normal. In no instance was a vesicular eruption observed.

The question arose, after this committee had presented its report, whether this removal of the epithelium were characteristic of the disease, and whether it did not depend merely on maceration in the profuse liquids after death, as suggested by Dr. Gairdner of Edin-

burgh. Among the reasons which might be urged against this latter belief, the following, suggested in the Boston Report, is worth inserting here. "The mucous surfaces of the vagina and of the urinary bladder are invariably smeared with a thick, whitish, pasty, or creamish secretion, which, on microscopic examination, is seen to consist entirely of detached epithelium cells, mostly perfect in shape, and generally distinctly nucleated. But *these* passages have not been subjected to maceration. The urinary bladder, indeed, is completely empty."

The committee of the College of Physicians was continued, and requested to examine the same mucous membrane in other diseases besides cholera, for the purpose of comparison.*

Serous Effusion in the Cavity of the Arachnoid.—Dr. Austin Flint has contributed very valuable observations on "Serous Effusion within the Arachnoid Cavity." This affection has received but little notice for some years past, attention having been more fixed upon effusions in the ventricles of the brain. As autopsies are usually conducted, it is easily overlooked. The precautions to be observed are these: not to divide the dura mater with the head dependent, but somewhat elevated; to remove the brain from the cranium before section of its substance, and without rupture of the investing arachnoid, allowing the sub-arachnoidean fluid to escape, and to remove it quickly after severing its connection with the medulla spinalis, endeavouring to estimate the quantity of blood and serum which escapes from the divided extremities. It is best to remove all above the tentorium before dividing this latter membrane, and afterward to remove the cerebellum. The fluid in the cavity of the arachnoid will be found at the base of the skull, and within the spinal canal. When morbid, its quantity may vary from half an ounce to six or more ounces; it may be translucent, made more or less opaque by the mixture of fibrin; or bloody from hemorrhage, or by the escape of blood from vessels divided during the examination.

This fluid during life will settle toward the spine, and first cause pressure on the medulla oblongata, producing early derangement of respiration and deglutition. Cases are quoted where these symptoms co-existed with effusion of blood in the neighbourhood of the medulla oblongata, and in some of which death evidently began by

* Transactions of Coll. of Physicians of Philadelphia, Dec. 4, 1849, page 35.

the failure of respiration, the heart continuing to act after breathing had ceased. Dr. Flint relates twelve observations of his own. Eleven of them were examined after death, and serous effusion was found in the arachnoid. In nearly every instance where the symptoms were known, respiration had been deranged, being "laboured," "hurried," "stertorous," "accelerated," "irregular," &c.

The propositions which we give below in a condensed form are considered by Dr. Flint as sufficiently sustained to deserve investigation.

Effusion in the arachnoid cavity, at the base of the brain, is liable to occur as an incident in the course of various affections, being immediately produced by cerebral congestion, and without premonitory symptoms from which we can predict it.

It is not an unfrequent cause of sudden deaths, such as are ascribed to cerebral congestion, or effusion within the ventricles.

It produces death by apnœa, from pressure on the medulla oblongata.

Among the means of distinguishing this affection are these: "Somnolency, or coma, without paralysis, not preceded by the symptoms of meningitis; disordered respiration; deglutition lost or impaired; intellect not disordered, if the patient is susceptible of being roused; forces carrying on the circulation not affected in proportion to the disturbance of respiration and deglutition; the *sudden* development of grave cerebral trouble, and rapid tendency to a fatal result by apnœa."

The gravity of the symptoms, the danger, and the suddenness of death will depend on the rapidity of effusion, as well as on the amount of fluid.

Insolation, or sun-stroke, when fatal, probably produces this effusion.

The presence of fluid in the arachnoid cavity, producing grave symptoms by compressing the medulla oblongata, is almost necessarily fatal; and it is doubtful if much can be expected from treatment.*

New form of Cerebral Disease.—Dr. L. V. Bell, the skilful Superintendent of the McLean Hospital for the Insane, at Somerville, Mass., has described a form of cerebral disease often witnessed in hospitals for the insane, which, though generally passing for

* For the details of these very interesting cases, see Buffalo Medical Journal for April, 1850, vol. v. page 633; also for May, 1849, vol. iv. page 744.

acute mania, really differs from that and every other affection of the brain, and may be easily recognized after being once noticed. It is marked by the following peculiarities: It attacks abruptly, and generally within a week compels a resort to the hospital. The want of sleep has then become extremely urgent. There are no signs of undue arterial action in the pulse. The delirium is suspended for a moment or two by an effort of attention. There is a loss of appetite and loathing of food, accompanied with the idea of its being poisoned or filthy. The hallucinations are characterized by an indefinite sensation of distress and horror, and the patient is not easily soothed by management, as in other cerebral affections. Although resembling at first sight the advanced stages of typhoid fever, especially in its delirium, it has none of the characteristic external marks of this disease. It is for the most part fatal, and runs its course, whether to death or recovery, in three or four weeks. It differs from mania in the following particulars. The mental disturbance is rather the delirium of bodily disease than of mania. The loss of appetite, want of sleep, and especially the sudden loss of strength, are seldom witnessed together in mania. The rapidity of its course, too, may be considered as a diagnostic symptom. It is distinguished from delirium tremens by the absence of the cause; by the character of the hallucinations, which are indefinite impressions of personal danger and sinfulness, rather than serpents, devils, sheriffs, vermin, &c.; by the absence of the pathognomonic perspiration of delirium tremens; and by the fact that the latter is limited to eight or ten days, generally terminating in recovery after a long and refreshing slumber. From meningeal inflammation it differs, in wanting the pulse of inflammation, in the absence of pain in the head, of intolerance of light, and of high raving delirium, all which are usually present in meningitis. The only treatment which seems to promise relief, consists in opium, and the alcoholic and diffusible stimuli, liberally used.*

Etherization in Insanity.—Ether was administered to sixteen patients in the Utica Asylum, in 1847, with no very definite result. A few were highly excited by it; several seemed intoxicated, and said they felt as if drunk; one rested remarkably well the next night; two experienced no effect of any kind from it; some were decidedly improved by it, were "more active, cheerful, and sociable." Dr.

* American Journal of Insanity, October, 1849.

Ray, the accomplished Superintendent of the Butler Hospital, Providence, R. I., has administered it in about a dozen cases, chiefly recent, and all characterized by considerable excitement. Usually the effect was only a temporary diminution of the excitement. In one case, it disposed the patient to take food, which she resisted before, and thus prevented the necessity of using the tube. In another, with suicidal and homicidal disposition, accompanied with great restlessness and vigilance, it was given every night at bedtime for about three weeks, with the effect always of procuring a quiet night.*

The experience of Dr. Bell, at the McLean Hospital, varies very little from the above.

Causes of Idiocy.—The Committee have been favoured with a communication from Mr. J. B. Richards, Principal of the School for Teaching and Training Idiots at South Boston, Massachusetts. It furnishes an account of the causes of idiocy, as illustrated by the investigations recently made under the auspices of that State. Out of 403 cases of idiocy, 302 were congenital; a fact which throws the responsibility of the existence of three-fourths of the cases directly on the parents. "And may we not inquire, with a great deal of emphasis, would not the condition of the remaining 101 have been greatly modified had their parents observed the laws of health, as *every parent* should do who takes the responsibility of bringing a human being into existence?"

Believing that idiocy results in a great measure from a low condition of the parents' vital forces, Mr. Richards enumerates the following agents which produce this condition; alcoholic drinks, licentiousness in all its forms, gluttony, exhaustion by too great mental or physical labour, weakness resulting from the want of sufficient mental or bodily exercise, low and insufficient diet, unhealthy occupations.

The following table contains important details, though the assumed connection between the idiocy and many of the circumstances named as causes must be very uncertain.

* Communicated by Dr. I. Ray.

Cases of Idiocy resulting from but one perceptible cause.

FIRST.—CONGENITAL IDIOCY.

One or both parents intemperate	38
" " simpletons	22
" " puny	26
" " scrofulous	61
" " related by blood	15
" " debilitated by previous licentiousness	2
Mother attempted abortion	5
" frightened during gestation	4
" insane	2
	175

SECOND.—IDIOCY NOT CONGENITAL.

By his or her own intemperance	8
" " " self-pollution	35
" epilepsy	20
" fever	3
" blow on the head	4
" violence at parturition	3
" dosing with laudanum for several years	3
" violent strangulation	2
" derangement of catamenia	1
Insanity, supervened idiocy	6
Measles	1
Head stuped in hot rum, by a nurse, when three days old	1
	87

Cases of Idiocy resulting from more than one perceptible cause.

FIRST.—CONGENITAL IDIOCY.

One or both parents intemperate and idiotic	8
" " " scrofulous	25
" " " related	1
" " " mother attempted abortion	1
" " " related and idiotic	1
" " " licentious	4
" " simpletons, scrofulous, and lived on low diet	1
" " " and mother a prostitute	1

One or both parents puny, and relations insane or idiotic	8
" " scrofulous and relations insane	1
" " " mother attempted abortion	1
Parents related by blood and idiotic	9
" " scrofulous	3
" " " and intemperate	5
" " mother frightened during gestation	1
Mother a prostitute and father married to cure masturbation	1
	71
Cases of congenital idiocy; cause not known	56
" idiocy not congenital; cause not known	14
	70*

Neo-macropia.—Professor C. Dewey describes a kind of abnormal vision which had hitherto been unnoticed. It does not consist in being near-sighted or far-sighted. Near and small objects, or larger distant objects, are not seen with distinctness. This defect occurs in children and young persons, and is remedied by convex spectacles, which are suited to the eyes of persons from sixty-five to seventy years of age. At the age of forty-five or more, it is much diminished. The causes of this peculiar kind of vision may be, 1st. Too little convexity of the crystalline lens. 2d. Its position too near the retina. 3d. Its too little density. Professor D. regards the second as the probable cause. More than fifty cases have fallen under his notice, during the past five or six years, in New England and New York.†

Spontaneous Hydrophobia.—A case of spontaneous hydrophobia is reported by Dr. Condie. A man, aged 35, of temperate habits, who could recollect no severe sickness except a short convulsive paroxysm several years ago, was attacked, on the morning of August 28th, with stiffness along the left side of the neck, and a sense of numbness in the arm of that side, which did not yield to appropriate treatment. It was followed by pain extending from the occiput along the left side of the neck and body, thirst, a sense of suffoca-

* Most of the facts in these tables I have been able to gather from some "field notes," made by Mr. Enos Stevens, for the commissioners appointed by the governor and council of this State, in the winter of 1846, "to inquire into the condition of the idiots of the commonwealth." J. B. R.

† Silliman's Journal.

tion, and convulsions on attempting to drink, and next day the fully developed symptoms of hydrophobia. "He declared that he had never been bitten by a dog, nor had for the last eighteen years received any wound or contusion. Upon a minute examination of his body, no cicatrix could be discovered." He died on the morning of the 30th. No autopsy could be had. "It was unquestionably a case of spontaneous hydrophobia," says Dr. Condie.

Angina Pectoris.—Dr. S. Kneeland, of Boston, has contributed an able monograph on the subject of angina pectoris. It brings the late physiological researches of Longet, Reid, and other eminent European observers to bear on the question of the pathology of this disease; and by a careful and thorough investigation establishes these propositions:—

"1. From the symptoms and morbid appearances, angina pectoris is not a disease of the lungs, heart, and its vessels, or stomach; but an affection of the nerves supplying these organs.

"2. Anatomy, physiology, and pathology would lead us to place the seat of angina pectoris in the par vagum, and not in the sympathetic system of nerves.

"3. Like other nerves, the par vagum may be affected with neuralgia and rheumatism; with inflammation; it may be compressed by morbid growths; its spinal origin may be compromised by hemorrhage, accidental wounds, and various irritations, all of which may cause the symptoms of angina pectoris.

"4. Angina pectoris and asthma are intimately related; the former being an affection more especially of the sensitive filaments of the par vagum, and the latter an affection of its motor filaments. Both are generally more or less combined in the same case.

"5. Angina pectoris is a disease not necessarily fatal, especially in young persons, if accurately diagnosticated and properly treated.

"6. In addition to the remedies of the books, special attention should be given to the inhalation of oxygen, and to the use of electricity.

"7. In cases of angina pectoris, attention should be directed to the examination of the par vagum, from its origin to its terminations, which, doubtless, on careful examination, will exhibit lesions sufficient to account for a fatal result."*

* American Journal of Medical Sciences, Jan. 1850, p. 43

Cerebral Symptoms in Heart-Disease.—It is well known that several English writers have, within thirty years past, pointed out the occasional connection of acute cerebral symptoms with lesions confined to the heart or pericardium, and the error in diagnosis which has frequently been made during life. Dr. Flint relates a case of pleuro-pneumonia complicated with pericarditis, masked by delirium, which is interesting in this connection. The cerebral symptoms appeared earliest; the pulmonary disease, when its existence was ascertained, was very naturally considered as secondary; and the cardiac disease was masked. The report is followed by very acute and candid remarks, suggesting the practical importance of correct discrimination in these deceitful cases, and of physical exploration of the thorax, even though there are no pulmonary symptoms.*

Dr. D. J. C. Cain has invited attention to another connection between cerebral and cardiac disease. He refers to eight cases before published, and adds one observed by himself. In all, there were repeated attacks resembling apoplexy or syncope, without paralysis, with the pulse permanently slow, but becoming still slower after each attack. In Dr. Cain's case, the pulse was thirty-four, and for a day or two, after each fit, as low as twenty-eight. The anatomical lesions were such as to impede the action of the heart, and prevent the brain from receiving a due supply of blood—for instance, atrophy or degeneration of the heart, patency of the aortic valves, and, in Dr. Cain's observation, compression of the heart and great vessels by three and a half pints of fluid effused in the pericardium, with softening of the ventricular walls.

Dr. Stokes ascribes some influence in producing these symptoms to congestion of the brain, either from increased impulse or mechanical obstruction to the return of blood. Dr. Cain argues, very conclusively, we think, for the view named in the above paragraph—from the feeble appearance of the patients, the feeble action of the heart; from the absence of characteristic apoplectic symptoms, the short duration and frequency of the attacks, the good effects of a recumbent position and of stimulants, and the inconstant and slight marks of congestion found on examination after death. One patient of Dr. Stokes' warded off attacks, on two occasions, by a peculiar manœuvre: "As soon as he perceives symptoms of an approaching attack, he directly turns on his hands and knees, keeping his head

* Buffalo Medical Journal, Feb. 1850, page 505.

low, and by this means often averts what would otherwise end in an attack." The inference can hardly be avoided that these attacks are analogous to syncope, and prove fatal by the heart's failing at last to resume its action after its momentary suspension.*

Causes of Pulmonary Consumption.—Pulmonary consumption is by far the most fatal disease in the United States, producing about one-sixth or one-seventh of the deaths in the large cities along the Atlantic, from which alone we have any very reliable returns. It has been regarded too much as a disease intimately connected with certain climates; and its dependence on bad modes of living, defective nourishment, confined air, &c., has been too little recognized. In a discussion in the College of Physicians at Philadelphia, Dr. Condie remarked that, "since more attention has been paid than was formerly done to the collection of correct statistics, consumption has been shown to be the disease rather of civilized life than of locality or climate." Besides hereditary influence, he names, as causes of this disease, "long-continued sedentary occupations, indoor confinement, particularly in narrow, ill-ventilated apartments, insufficient nutriment, close mental occupation, unbroken by relaxation and active exercise, anxiety of mind." When the great frequency and almost uniformly fatal course of this disease are duly considered, it must be acknowledged highly important that physicians understand correctly its causes. Especially ought the fact to be borne in mind that its causes are not inseparably associated with the temperate climates, but may be more or less completely controlled by prudence, philanthropy, and science.

Dr. Riofrey, of Paris, author of a work on the curability of consumption, agreed with Dr. Condie as to the importance of hygienic treatment, compared with any medicine.† At a meeting of the National Institute, Dr. Riofrey mentioned that he considered a high northern or southern latitude alike favourable in cases of predisposition to this disease. He named the American coast, from lat. 55° north to 17° south, as consumptive latitudes. Several facts were alluded to, which appear to confirm the belief that a moist air tends to lessen the liability to consumption.

Intestinal Auscultation.—Professor C. Hooker, of Yale College, has published an essay on Intestinal Auscultation, founded on more

* Charleston Medical Journal and Review, May, 1849, page 271.

† Transactions of the College of Physicians of Philadelphia, Nov. 20, 1849.

than twenty years' attention to the subject. The loud sounds of rolling liquids in the bowels in Asiatic cholera were noticed in a published article by Dr. Hooker, in 1833. These sounds were noticed during the past year by many who had not seen this article. This commotion was increased by stimulants and astringents, and by opium given in doses not large enough to cause alarming prostration. Frequent small doses of camphor, with the free use of ice, moderated it. A single drachm dose of calomel almost invariably caused a total suspension of these movements, producing intestinal silence and repose, usually for eight to twelve hours, followed by natural peristaltic murmur and grass-green evacuations.

Cholera morbus is usually attended with quick, irregular, peristaltic, and anti-peristaltic motions, marked by sounds different from those of Asiatic cholera. The differences of sound are of course not so easily described in words as appreciated by the ear.

Common colic has an incipient, forming stage, during which the physician is not often consulted, but which may be recognized. There is general languor, often some depression and chilliness, and numb, heavy, or cold feeling in the abdomen. Now this important stage may be known by the utter absence of peristaltic murmur in the small intestines; a little rumbling being heard perhaps from the large intestine. During the violent symptoms, peristaltic motion is still suspended. Anti-peristaltic sounds, or some sound from the pressure of the abdominal parietes producing momentary movement, may be heard, but very transiently. But true peristaltic movement, producing a continuous murmur, is a sign of approaching relief. In lead-colic, the suspension is longer continued, and yields not all at once, by a sudden crisis.

These signs may aid us in prognosis, and in determining whether medicines are required in cases of colic, diarrhœa, &c. They may forewarn the physician of the approach of an attack, before the patient is apprised by any decided symptoms, as the physical signs in thoracic diseases sometimes enable us to foretell an affection that does not yet reveal itself by rational signs.*

Dr. Breed, of the Cambridge Laboratory, with a view to ascertain the influence of evaporation and pressure upon the formation of blisters, made a series of experiments with plasters of cantharides, with hot water and steam, of which the following may be recorded:—

1st. Two fingers were held in boiling water about three seconds.

* Boston Medical and Surgical Journal, July, 1849, page 409.

One was immediately dressed with oil (oleum olivæ), and the other left exposed to the air. On retiring five hours after, there being but little soreness, the dressing was removed, under the belief that there would be no blister. In the following morning, however, both fingers were blistered over the entire scalded surface, and they were equally sore.

2d. With the intention of quickly producing a blister, two fingers were held in water at 212°, during fifteen seconds. The water was then cooled by adding cold water, that the fingers might be kept immersed. One finger was covered, while yet in the water, with oil and cotton, and well wrapped. The other was withdrawn from the water without dressing, and exposed to the atmosphere. After several hours, a blister filled on each finger; first, however, on the one which was dressed.

3d. Two fingers were exposed to water at 212° during ten seconds. One was immediately put in a caoutchouc bag filled with water, and the other was left exposed ten hours, and then slightly wrapped in linen. In five hours, the exposed finger was blistered along and within the margin of the part scalded. On the central portion of the affected part no blister rose. In eight hours, a blister rose on the other finger large enough to be distinctly felt through the caoutchouc. After thirty hours the bag was removed, revealing a blister, as thick as the finger itself, over the entire scalded surface. The skin not scalded, and yet covered by the caoutchouc, was much corrugated and white. An hour after the scalding in this case, upon drinking freely, the pain in the fingers was greatly increased.

4th. Two places on the arm were exposed to steam at 212°, one three and the other ten seconds. The former was merely covered by the ordinary clothing, and to the latter was applied a linen compress and a tight bandage. The spot to which no pressure was applied soon blistered and became very sore. Upon the other, the pressure was continued sixty-nine hours with removal every twelve hours for examination. In this place, there was no blister and but little soreness after six hours. The part remained white from the first until the cuticle began to dry and become dark coloured.

5th. A good blister plaster (emplastrum cantharidis) was placed upon the arm, covered by a large, wet poultice, and a bandage applied over these so as to produce considerable pressure. No blister was produced in twenty hours, but on removing the poultice a blister quickly filled.

6th. Emplastrum cantharidis was applied to the side and more

tender part of the finger, and a caoutchouc bag filled with water, then drawn over the finger so as to exclude the air and prevent cutaneous evaporation. After forty-nine hours the finger was examined, but there was no blister. Washing the finger, it was again placed in the bag of water for twenty-six hours. At the end of these seventy-five hours, the dressing was finally removed. No blistering was produced, but there was slight soreness twelve hours after the water was removed.

7th. A blister plaster was applied to the side of the finger and covered with caoutchouc, making some pressure. In twenty hours there was considerable soreness, but, at the end of fifty-three hours, the removal of the plaster showed no blister. Hastily washing the part, the bandage was reapplied and allowed to remain forty-eight hours longer, with removal every twelve hours, to examine and wash the finger. No blister was produced.

The conclusions derived from these experiments are:—

1st. That evaporation is not essential to the formation of a blister.

2d. That a certain degree of pressure will prevent the formation of a blister.*

Do all these causes act to separate the cuticle from the true skin? Upon the separation the serum is poured out, filling and distending the cavity and forming a blister.

The following inquiries have suggested themselves.

Does a proper degree of pressure prevent the formation of blisters by preventing the effusion of serum?

Does oil, when rubbed on the locality of a scald or burn, retard or prevent a blister by its being absorbed, and as oil and water will not unite, thus opposing the flow of serum?

Does cold water, by contracting the minute vessels, obstruct the flow of serum?

Do cold water, ether and turpentine relieve pain by so reducing the temperature that the chemical decompositions incident to the burn, and which are concomitants of the pain, are arrested?

May the cold water when taken in by endosmosis, aid to restore the injured part by dissolving, and thereby promoting the absorption and removal of the destroyed organism?†

* Blisters may be produced by pressure and friction, such as takes place in pumping with hands unaccustomed to this kind of labour, by sudden extreme cold, as with solid carbonic acid, or intensely cold metal, or heat, in a great variety of ways, from either solids, liquids, or vapours, and by rapid evaporation according to Liebig.

† Communicated through Dr. John B. S. Jackson.

Urinary Calculi.—Professor Peter, of Transylvania University, has formerly published valuable observations on the chemical characters of urinary calculi. During the past year, he has published analyses of calculi recently removed by lithotomy from seven different patients. In two calculi, the nucleus was mainly oxalate of lime, surrounded by the phosphates of lime, magnesia, and ammonia; in one, oxalate of lime, covered with a thin coating of earthy phosphates. In two single calculi, and two pairs (coming each from a single person), the nuclei were mainly urate of ammonia, containing in each case, except in one pair, some oxalate of lime, either mingled or imbedded with the deposit which formed the nucleus; the exterior contained oxalate of lime, and earthy phosphates.

Professor Peter's former article in the *Western Lancet* gives a view of the composition of calculi in the large collection of Transylvania University, compared with that of several contained in European collections. "The peculiarities of the Lexington collection, as compared with the others whose history we have been able to learn, are as follows:—

A. *As it regards the nuclei.*

"1. A great deficiency in the proportion of pure uric acid.

"2. A great excess in the proportion of nuclei of urate of ammonia, and of the earthy phosphates.

B. *In relation to the general composition.*

"The same peculiarities pointed out in regard to the nuclei, with the additional one,

"3. An excess in the proportion of the mulberry, or oxalate of lime calculus."

There was but one case of pure uric acid calculus from the blue limestone region, where the water is strongly impregnated with carbonate of lime.

The newly-reported analyses are cited as confirming former researches as to the chemical character of urinary concretions in the great blue limestone district.

Urate of ammonia is often found deposited even in the tubuli uriniferi of new-born children. It is soluble in about 480 parts of cold water, and still more freely in hot water, and can only be deposited when the urine contains less than its normal quantity of water, in proportion to the salts. When deposited, it forms a

nucleus, round which an impermeable coating is easily formed of oxalate of lime, or the earthy phosphates, preventing its solution in the urine. The free use of *pure* water, and watery, succulent food, is recommended as a preventive of this disease, as well as of gout, and other affections in which there is too much saline matter in the animal fluids.*

Dr. J. Neill has reported an interesting case of renal calculi, in a girl twelve years old. The calculi were composed of phosphate of lime, were extensively branched, occupying the pelvis and infundibula of the kidneys, white, shining, and crystalline in appearance. They weigh five hundred and ten grains. The organs were enlarged, their cavities distended with albuminous and puriform liquid; and their parenchyma so thinned and altered that the glandular structure could not be well distinguished. The child had suffered from incontinence of urine for three years or more; her urine had been albuminous; she had been thin and pallid. Before death, she had several attacks resembling fits of gravel, but was running about the second day before she died.†

A paper of much surgical interest, by Dr. J. Mason Warren, of Boston, mentions the composition of calculi in six cases which occurred in his practice. Two consisted mostly of oxalate of lime; in one, combined with uric acid, and a small quantity of carbonate of lime; in one, surrounded by the triple phosphate, in sharp and glittering crystals. Three would appear to have been composed of phosphates. We are left to suppose that the above-named cases originated in or about Boston. One patient was from Montgomery county, New York. He had a calculus of very rare kind, consisting of *cystic oxide*, intersected by layers containing phosphates.‡

In the Museum of the Boston Society for Medical Improvement, there are twenty-two specimens of urinary deposits from different human beings, whose composition is named in the very valuable "Descriptive Catalogue." Most or all these patients appear to have been residents of New England, three specimens furnished by Dr. Flint, of Kentucky, being not counted. Their composition in the main was as follows: Of uric acid, five, in one surrounded by thin layers of oxalate of lime, and the mixed phosphates. Uric acid and the urates, three. Urate of ammonia, one. Uric acid nucleus and mixed phosphates, two. Urate of ammonia and mixed

* Transylvania Medical Journal, Dec. 1849, and Feb. 1850.

† American Journal of Medical Sciences, July, 1849, page 120.

‡ Ibid., page 47.

phosphates, one. Nucleus of urate of ammonia and uric acid, surrounded by mixed phosphates, one. Uric acid and urates of potash and ammonia, with mixed phosphates, uric acid being in excess in the nucleus, one. Urate of ammonia and oxalate of lime, one. Phosphate of lime, two; being partially covered in one by a brown crust of *xanthic oxide*. Mixed phosphates, two. Oxalate of lime, two; in one having a thin, uniform coating of uric acid. Oxalate of lime nucleus, surrounded by mixed phosphates, one.

Besides the above twenty-two, there are in the same museum three calculi presented by Dr. Joshua B. Flint, of Louisville, Kentucky. All contain phosphate of lime; combined in two with uric acid, urates, and animal matter, in the third, with one-tenth of carbonate of lime.

We would beg leave to commend to our successors this inquiry into the connection of different urinary deposits, with the geological characters of different parts of our land. No civilized country offers so wide a field for such comparative research. No body of medical men could so appropriately undertake it.

VITAL STATISTICS.

Causes of Mortality in Children of the two Sexes.—It is well known that the number of male children at birth considerably exceeds that of female children. But this preponderance of males is soon lost by reason of their greater mortality; so that the numbers of the two sexes living at the age of ten years are very nearly equal; and at the fifteenth year the living females outnumber the males about as much as the males did the females at birth.

The greater mortality of boys has been attributed to their greater exposure, and more hazardous sports and employments. But it appears that the greatest excess in the male deaths occurs in the very early months of infancy, before any material change has taken place in the exposure of the sexes to external circumstances. In older children, the greater risks of boys in climbing, swimming, &c., are nearly, if not quite, counterbalanced by the greater exposure of girls to burns and scalds.

If the particular diseases which prove fatal to children be examined, it will be found that those of males are inflammatory affections of the organs of respiration, circulation, and nutrition, but more especially inflammations of the brain and appendages, with the ordinary consequences, serous effusions and convulsions.

On the other hand, the principal diseases of which female children die in greatest proportion are hooping-cough, small-pox, scarlet fever, measles, thrush, and consumption. Thus, the diseases most fatal to male children appertain to the sthenic class, and are those usually characterized in their incipient stages by excessive inflammatory action, prone to attack subjects in whom the energies of life are most highly developed; while the diseases to which female children succumb in largest proportion are allied to the *asthenic* class, being most liable to prove fatal where the forces of organic life are comparatively feeble, and having their seats mostly in the mucous and cutaneous tissues.

In connection with this view of the subject, it may not be deemed improper to mention some of the fatal diseases of male and female children under five years, in a large mass of European reports, and their relative proportions in each sex.

	Males.	Females.
Inflammation of the brain	328	281
Convulsions	2550	2081
Dropsy of the brain	1481	1151
Inflammation of the lungs	2659	2411
Croup	343	303
Inflammation of the stomach and bowels	489	376

In these diseases, there was a greater or less preponderance in the male mortality. On the other hand, some of the diseases most fatal to female children were the following:—

	Males.	Females.
Hooping-cough	1115	1445
Small-pox	232	240
Consumption of the lungs	967	920
Thrush	208	206
Measles	1048	1020

The number of female deaths from the three last diseases is not quite so great as that among males. But it is decidedly greater in proportion to the number of girls living under five years of age.

These statistical results, while they correct the common error of ascribing the excessive mortality of male children to their greater exposure to casualties, the weather, &c., show that the main cause is to be sought for in sexual differences of organization, each sex being endowed with peculiar physical characteristics, which tend, even at this early age, to develop certain diseases and determine

their results. These facts, beside being curious, suggest hints as to the medical treatment of children. The prominent fact that boys are more prone to succumb to diseases of high inflammatory action must surely demand more particular attention to discrimination in the treatment of their diseases, and the adoption of more prompt and energetic measures for reducing these exalted actions which tend to disorganization and death.

On the other hand, with patients of the female sex, even in infancy, increased caution should be observed to guard against the effects of debility, and provide timely support to the more feeble resources of the female system.

Influences operating to Change the Number of Births, and also the Proportion of the Sexes at Birth.—1. The seasons. The following general results relative to this point were obtained from estimates based upon 65,542 births in Philadelphia. The greatest number of conceptions occurred during the winter and spring months, the maximum being 17,645 in the spring months. The smallest number occurred in the summer and autumn months, the minimum being 15,200 in the summer quarter.

The greatest excess of male conceptions is shown in the winter season, when, the total being 17,184, the males were 9,007, and the females 8,177. The excess of male conceptions for the other three quarters or seasons varies but little from the minimum excess, which occurs in spring.

2. The plenty or deficiency of food, purity or impurity of the air, overworking, and whatever tends to exalt or to impair the vital energies of the people. In many parts of Europe, where the general population is overworked and under-fed, the excess of male births is very small; being throughout France and Prussia under 6 per cent., and in England about 5 per cent. In Philadelphia, where the general condition of the population is very favourable, the male births exceed the female about 7 per cent. In the rural districts of the United States, and especially in the newest settlements, the preponderance of boys at birth is believed to be not less than 10 per cent. An opposite result is found when fatal epidemics alarm and depress the public mind. Thus, children born in Philadelphia, whose conception occurred during the prevalence of cholera in 1832, show a preponderance of females. The same results are shown in the births at Paris, which took place nine months after the epidemic prevailed there in 1832. The births at a somewhat longer period after the

visitation of an epidemic, exhibit an increase in the amount of males, because the parents are endowed with vital energies above the average, as is shown by their exemption or recovery from disease.*

TOXICOLOGY AND MISCELLANEOUS MATTERS.

Mode of Action of Poisons.—Professor James Blake, of the St. Louis University, has continued his experiments, illustrating the mode of action of poisons. It is well known that this gentleman has maintained, by experiments, the doctrine that the most rapidly fatal poisons act only by being absorbed into the blood, and that the nerves are incapable of propagating their action from the part to which they are applied, so as to produce the constitutional symptoms.† The question of absorption he regards as a simple one; we must ascertain the time required for a poison to be conveyed by the blood from one part of the system to another; and this fundamental point seems heretofore to have been neglected by experimenters upon the subject. Dr. Blake has shown that the blood circulates through the body from the jugular vein in from four to sixteen seconds, in the animals experimented upon; and in no instance was the action of the poisons manifested in less time than would suffice for their distribution through the system. Dr. B., then, does not believe that poisons act instantaneously, however strongly this doctrine has been supported; and he makes some remarks which are well worthy the attention of the physiologist, in regard to the liability to error in noting small intervals of time.

One principal object in Dr. Blake's paper seems to be to answer the criticisms of Dr. Christison and Mr. Taylor on his experiments published some years ago. He shows that animals, whose circulation is very rapid, are unfit subjects for observation. The nature of the poison must also be attended to, a volatile substance applied to the mouth being, perhaps, inhaled so as to produce effects before the experiment has properly commenced. Both these points had been apparently overlooked by Christison and Taylor. Finally, Dr. Blake, after referring to some of his late experiments, which only confirm those already published, concludes by an account of an experiment which was admirably contrived to show in how short a time death would ensue from that most volatile substance, concentrated hydrocyanic acid. A rabbit, whose blood circulates through the

* Communicated by Dr. Gouverneur Emerson, a member of the committee.

† See Edinburgh Med. and Surg. Journal, vol. liii.

body in four seconds, was selected; the jaws were kept open with forceps; about half a drachm of the acid was enclosed in a well stopped tube, to prevent its being inhaled; the tube was placed in the mouth; at a given signal the forceps were closed, the tube was crushed, and the animal, having jumped from the table on to the floor, was perfectly able to stand upon its feet; in two seconds and a half after the application of the poison it fell on its side, and in five seconds it was dead.*

Poisoning by Cedar Oil.—Dr. S. C. Wait reports four cases of poisoning by cedar oil, the oil of Juniperus Virginiana. They prove that this substance is a powerful narcotico-acrid poison, having more decided effect on the whole nervous system than is usually ascribed to savin, to which it has been considered as allied. All the four patients were females, and three of them took the oil to procure abortion. The symptoms ensued very soon after taking the poison; they were violent pain in the stomach; convulsions, both rigid and intermittent; eyes glaring; face red and contorted; moans or peculiar and frightful groans; respiration struggling and catching, with exaggerated action of the inspiratory muscles; pulse slow and large. Somnolence soon ensued. In the two that recovered, reaction was established within a few hours, followed by fever. In one case, delirium, dizziness, distress at the stomach, and general soreness. In the two fatal cases, the somnolence was followed by coma, dilated pupils, breathing more laborious, and at times stertorous, complexion of a venous hue, pulse growing slower and then intermittent. Death ensued in each case about an hour after the poison was taken, if the physician's narrative be quite accurate in this point. There were small patches of redness on the mucous membrane of the stomach, and larger portions which had lost the "usual polished appearance." The oil was smelt in the secretions during life, and in the stomach after death. It is to be regretted that the autopsies were not conducted or recorded more fully and accurately. Besides emetics and frictions, twelve or sixteen ounces of blood were drawn in the two cases which occurred last in time, without important effect; one of these cases was fatal, one recovered.†

* American Journal of Medical Sciences, July, 1849, page 97.

† Report by Dr. S. C. Wait, of Gouverneur, St. Lawrence Co., N. Y., Boston Med. and Surg. Journal, July, 1849, page 469.

Effects of Strychnia and Hydrocyanic Acid.—A large black bear, belonging to Professor Agassiz, and about eighteen months old, was poisoned by strychnia and hydrocyanic acid. Three grains of strychnia were first given; in ten minutes, another dose was offered in a biscuit, but was not swallowed. In five minutes more, terrible convulsions ensued, and the animal died within twenty-five minutes after taking the strychnia. Hydrocyanic acid was poured on its nose and mouth to hasten death. Though the bear had appeared in good health, decomposition was very rapid, being as advanced in appearance within twenty-four hours as if the animal had been dead two months. About twenty hours after death, the body being still warm, an offensive gas was issuing from every pore. The blood had not coagulated, the spinal marrow and nerves were in a semi-fluid state, and the flesh had assumed a leaden-gray colour. The hair came out on being slightly pulled. The muscles, brain, nerves, and kidneys, all gave off hydrosulphuric acid gas, while the liver did not.

Chloroform as an Antidote to Strychnia.—Dr. Diesbach, of Tiffin, Ohio, reports a case of poisoning by strychnia, relieved by chloroform. A man drank three ounces of a solution of strychnia, containing one grain in the ounce, made from the crystals. In twenty minutes, he was found to be affected with extremely rigid spasms of the muscles, "sense of burning about the stomach, tightness about the chest, vertigo and dimness of vision, lower extremities cold, and perspiration flowing in a stream from his head and chest." He swallowed two drachms of chloroform (well diluted, we hope), and was completely relieved in less than fifteen minutes.*

Comparative Effects of different Anæsthetics.—Dr. C. T. Jackson has presented the results of observations on the comparative effects of the inhalation of nitrous oxide, the vapour of chloroform, and sulphuric ether. Nitrous oxide, administered in large doses, produces great excitement, which increases with the quantity inhaled. The vapour of chloroform, when rapidly inhaled, produces an immediate and entire prostration. The same is true, in a less degree, of sulphuric ether. They do not produce the intoxication which is caused by nitrous oxide; and this agent, also, when introduced slowly, fails to produce the usual effects. The vapour of chloroform slowly inhaled has an injurious influence, disorganizing the

* Western Lancet, February, 1850, page 93.

blood, and stopping the circulation in the capillaries. When suddenly introduced, it retards, but does not stop, the circulation. Patients to whom it is slowly administered recover slowly, and it is important in all cases that enough air should be admitted with it. Persons inhaling nitrous oxide retain the sensibility to touch, and respiratory action is quickened, increases, and becomes deeper as the inhalation is prolonged. During the inhalation of chloroform and ether, on the contrary, the respiratory action diminishes. Under the influence of exhilarating gas, the system is made very irritable. Dr. Jackson thought that the few cases of excitement after the inhalation of ether might be attributed to the previous state of mind of the patient, or to alcohol combined with it. Conclusions drawn from experiments on animals with these agents should be received with great caution, for their action on animals differs according as these have or have not a cutaneous perspiration. It kills those of the latter class. Dr. Jackson recommends a mixture of chloroform with alcohol, in the proportion of an eighth or a quarter of an ounce of the former to four ounces of the latter.*

Effects of Anæsthetics on Vegetable Organs.—In the valuable report on the Medical Botany of South Carolina, published in the Transactions of this Association for 1849, Dr. F. P. Porcher describes some experiments similar to those of Professor Marcet, of Geneva, on the action of anæsthetic agents on what are called sensitive plants. Dr. P. experimented with the Schrankia angustata or uncinata. Chloroform and sulphuric ether, placed on the main petiole of the leaves, caused the leaflets to contract successively, and these impressions were never conveyed downward, beyond the junction of the branch experimented on with the main limb. A drop of oil of aniseed, placed on a leaf-stalk, seemed to stop the passage of these influences. "Hence," says Dr. Porcher, "we may be led to suspect that the impression is conveyed by organs of sensation arranged not far from the surface." These experiments are also thought to illustrate "the relations existing between animal and vegetable sensibility."

The experimental decisions of Professor Blake, with respect to the action of poisons in animals, in which nervous and absorbent apparatus both exist, would seem to contradict the idea of a nervous medium of transmission in organized bodies in which *no* nervous

* Annual of Scientific Discovery, Boston, 1850, page 165.

system is known to be present. The term *sensibility* is used vaguely, sometimes as synonymous with susceptibility in general, or with contractility. But its employment in the first of these senses is purely figurative; and in the second is inaccurate. Contraction can no more be taken as evidence of sensibility than sensation can be taken as evidence of contractility. Each power has its own peculiar organic condition necessary to its exercise, and its own peculiar relation to stimuli. The fibre that feels, and the fibre that contracts, are different, and neither can officiate for the other. It is from some such equivocation as this that the mimosa and schrankia have been denominated sensitive plants; that physiologists have come to speak of illustrating the relations which exist between animal and vegetable *sensibility*, and special organs of sensation in the plant are hypothetically created.

The relation of anæsthetics to the vital powers of animals is a question yet unsolved. To which of the two, the *vis nervosa* or the contractile power, are these substances most intimately related? If they affect alike both kingdoms of life, and contractility is the only one of the two functions which is common to the animal and vegetable, then it would seem that their relation is to this; and that, in the animal, whatever influences are communicated to the nervous system are secondary. It has indeed often been observed that the effect on the muscular system precedes that on the nervous, and in some instances is the only impression which can be produced. The rationale of sudden death, accepted by many, ascribing it to paralysis of the muscular fibres of the heart, is in perfect congruity with this view.*

Action of different Waters on Lead-Pipes.—Professor E. N. Horsford was requested by the consulting physicians of the city of Boston to investigate the subject of the action of water on leaden service-pipes. We extract the most important results obtained by him.

"The waters used by man, in the various forms of beverage, and for culinary purposes, are of two classes: viz., 1. Open waters derived from rain-falls and surface-drainage, like ponds, lakes, rivers, and some springs; and 2. Waters concealed from sun-light, and supplied by lixiviation through soils or rock, or both, of greater or less depth, such as wells, and certain springs.

* Communicated by Dr. James Moultrie, a member of the committee.

"They differ in temperature. Well-water, through a large part of the year, is colder than lake, pond, or river water. In the per centage of gases in solution: recently drawn well-water, in summer particularly, parts with a quantity of air upon exposure to the surface temperature. In winter, these relations must, to some extent, be inverted, in high latitudes for a longer, and in lower latitudes for a shorter, period. They differ in the per centage of inorganic matter in solution; well-waters contain more. In the relative proportions of salts in solution, well-waters contain more nitrates and chlorides; and in the per centage of organic matter, they contain less.

"*Relations of Lead to Air and Water.*—Lead is not oxidated in dry air, or in pure water deprived of air. It is oxidated in water, other things being equal, in general proportion to the amount of uncombined oxygen in solution. When present in sufficient quantity, nitrates in neutral waters are, to some extent, reduced by lead. Both nitrates and chlorides promote the solution of some coats formed on lead. Organic matter influences the action of water on lead. If insoluble, it impairs the action by facilitating the escape of air; if soluble, by consuming the oxygen in solution, and by reducing the nitrates when present. The green plants, so called, and animalculæ which evolve oxygen, are abundant in open waters in warm weather only, and of course when the capacity of water to retain air in solution is lowest; so that, though oxygen is produced in open waters by these microscopic organisms, it does not increase the vigor of their action on lead. Hydrated peroxide of iron (iron-rust) in water is not reduced by lead. Hence may be inferred the freedom from corrosion of leaden pipes connected with iron mains, so far as the reduction of the pulverulent peroxide of iron may influence it. Alkaline chlorides in natural waters deprived of air do not corrode lead. Salts generally impair the action of waters on lead by lessening their solvent power for air, or for other salts. A coat of greater or less permeability forms in all natural waters to which lead is exposed. The first coat is a simple suboxide absolutely insoluble in water, and solutions of salts generally. This becomes converted in some waters into a higher oxide, and this higher oxide uniting with water and carbonic acid forms a coat soluble in from seven thousand to ten thousand times its weight of pure water. The above oxide unites with sulphuric and other acids, which sometimes enter into the composition of this last coat; uniting with or-

ganic matter and iron-rust, it forms another coat which is in the highest degree protective."*

Moisture, Ammonia, and Organic Matter in the Atmosphere.—Professor Horsford presented, at the meeting of the American Association for the Advancement of Science, held in August last at Cambridge, some observations on the amount of moisture, ammonia, and organic matter in the atmosphere.

Moisture.—These observations were commenced February 28th, 1849, continued daily till April 12th, and since then occasionally, and were accompanied by observations of the barometer, thermometer, appearance of the sky, and the wind. The method employed was that of Brunner. A known volume of air is transmitted through a chloride-of-calcium tube, which is weighed before and after the experiment. The difference in weight shows the amount of moisture in a given volume of air. Among the results are these: The moisture is in general proportion to the temperature. Slight variations are not accompanied by corresponding variations in the moisture. Great variations in the quantity of moisture may take place, while the temperature and altitude of the mercurial column remain constant; the moisture has even doubled within an hour, though the temperature became reduced. In general the moisture on the same day seemed to depend chiefly on the direction of the wind. The least quantity observed was on March 12th, during a N. W. or N. N. W. wind; the largest was on June 23d, in a S. W. or S. S. W. wind. The quantity on the latter day was to that on the former as fifty to one.

The *permeability of atmospheric air to aqueous vapor* was established by experiments continued through several months, and was found to increase with the temperature.

The *quantity of ammonia* was tested by an apparatus of Professor Horsford's own construction. In contriving it, the object was to transmit the air through a constantly renewed atmosphere of hydrochloric acid vapour. A series of tubes and flasks containing asbestos drenched with hydrochloric acid were connected with a safety-tube, which was connected with an aspirator. Through this apparatus a known volume of air was transmitted. At the conclusion of the experiment, the apparatus was thoroughly rinsed with distilled water, and the ammonia determined in the usual manner with bichloride of platinum.

* Proceedings of American Academy, 1849.

Two determinations were made during an east wind, the one on air at the end of a wharf in Boston, looking out on the ocean, the other in a court pointed out by an assistant of the city marshal, as the worst habitable part of the city, and in which the air was found to be extremely offensive. The one atmosphere was not distinguished above the other on account of its ammonia.

Continued observations, since the above mentioned were laid before the Association, have shown that the quantity of ammonia is greatest in summer, and that it diminishes with the decay of animal and vegetable matters, until, in winter, when decay is quite arrested, the quantity of ammonia is reduced to a minimum.

The following table shows the amount of ammonia found in the atmosphere at thirteen different analyses:—

Date.	Am. in 1,000,000 parts by weight of Air.
1. July 3	42.9995
2. " 9	46.1246
3. " 9	47.6308
4. Sept. 1–20	29.7457
5. Oct. 11	28.2396
6. Oct. 14	25.7919
7. Oct. 30	13.9315
8. Nov. 6	8.0953
9. Nov. 10–12–13	8.0953
10. Nov. 14–15–16	4.7066
11. Nov. 17 to Dec. 5	6.1328
12. Dec. 20–21	6.9885
13. Dec. 29	1.2171

Some very limited observations would tend to show that the organic effluvia in the air are of an acid character.*

Prof. Horsford has made some experiments to determine the amount of ammonia in the pulmonary and cutaneous exhalations of a kitten. The amount is found to be very considerable.

Determination of the Ammonia in Human Breath.—By J. A. Porter, of the Cambridge Laboratory.

$Pt\,Cl_2\,NH_4\,Cl$	Grm.	0.0645	
NH_3	"	0.0049	for 45 minutes
	"	0.0072	for 1 hour
	"	0.1743	for 24 hours
	Grains	2.6898	"

* Proceedings of American Association for the Advancement of Science, 1849, p. 124.

Ozone.—This substance has come into notice during the year past from its supposed connection with catarrhal diseases, as noticed in Europe; and with cholera, as suggested by physicians of Chicago. The nature and even the individuality of ozone are not quite determined. Professor Peter has published interesting observations on this subject. He tested the amount of ozone in the air at Lexington by the usual means, a strip of bibulous paper being smeared with a paste of starch and a solution of pure iodide of potassium. His observations were daily, from June 30 to August 12, being not far from the complete period in which cholera prevailed at Lexington. There was no constant relation between the probable amount of ozone in the air and the daily number of deaths; the indications of ozone did not cease with the cessation of cholera; and it would seem that the principle which discolors the iodide of potassium is rarely absent from the atmosphere.

Some considerations unfavourable to the supposed influence of ozone are these: Ozone is a vaporous or gaseous substance, and must tend to diffuse itself equally, which the cholera does not. If ozone is produced by electrical causes, it certainly must be present in the atmosphere of South America, which is known to be remarkably exempt from the epidemic. As the slow combustion of phosphorus produces ozone, workmen in manufactories of friction matches should suffer from the diseases produced by it. The ozone theory of cholera, on the whole, is not sustained.*

Professor Ellet made analyses of the air in New York, under the auspices of the Board of Health, during the prevalence of cholera in that city. His results were wholly negative in regard to the prevalence of any foreign matter in the air. As to ozone, he says, "I was forced to the conclusion not only that no such peculiar principle or condition existed in the atmosphere at the time, but that the experiments of those European chemists who have announced the production, by artificial means, of such a new form of matter, or such a modified or 'allotropic' condition of any of those forms previously known to us, are unsatisfactory."†

Prof. Horsford has observed that ozone, subjected to a heat of 130° Fahrenheit, loses its properties.

* Transylvania Medical Journal, Oct. 1849, p. 148.

† Report of Sanitary Committee on Cholera in New York, 1849, page 59.

This sketch of the progress of medical science within our own country during the last year relates only to the particular branches assigned to this committee. With the latitude allowed to their predecessors, the committee could have doubled the amount of materials, many of them of the highest value and interest. They, however, cannot but approve of the restriction imposed, and recommend its continuance. European intelligence reaches most of us through periodicals and retrospects, and any reprint from them of facts, however judiciously selected, tends to enhance the expense of our publications. There is a still greater evil attending the introduction of foreign matter into our reports. It impairs the vigilance and industry necessary to the accumulation of intelligence that is purely American. In so widely-extended a country, it is a laborious task to gather materials for such a purpose. Many interesting facts must occur that never come to the knowledge of a committee, even when foreign matter is excluded, as the present report abundantly shows. Still more must this be the case when the labour of collecting domestic matter can be diminished by substituting foreign materials.

By adherence to this restriction, the future reports of American intelligence will be annually growing richer. Master minds are now employed in the various departments of natural and experimental science. Leidy and others are toiling with zeal and industry in our large cities; and Agassiz, Guyot, Horsford, and Wyman have girded themselves to the work in a scientific institution under the fostering care of ancient Harvard, whose light, like the rising sun, is gilding the east, and shedding its beams over our wide-spread country to warm and fertilize the American intellect. Already in the Valley of the Mississippi, where, within the memory of the living, the red man was lord of the domain, beautiful cities adorn the banks of the majestic rivers, with colleges and seminaries of learning where gifted minds are diffusing the blessings of science and literature; and in this lovely city, the "Queen of the West," where the Indian council-fire blazed, and war-whoop echoed, we behold the sublime spectacle of many hundred votaries of the healing art assembled from all sections of the Union, thirsting for knowledge and eager for mutual improvement. Who can contemplate the scene without a thrill of professional enthusiasm, or doubt for a moment that a rich harvest of American medical science will ere long be annually collected and diffused through the instrumentality of this Association?

USHER PARSONS, *Chairman.*